

Chemistry
Standard level
Paper 1B

Practice paper

Topic: Chemical Bonding & Structure (Topic 4)

1. The table below shows some physical properties of four unknown substances A, B, C, and D.

Substance	Melting Point / K	Conductivity (Solid)	Conductivity (Liquid)
A	1074	Poor	Good
B	3550	Poor	Poor
C	933	Good	Good
D	273	Poor	Poor

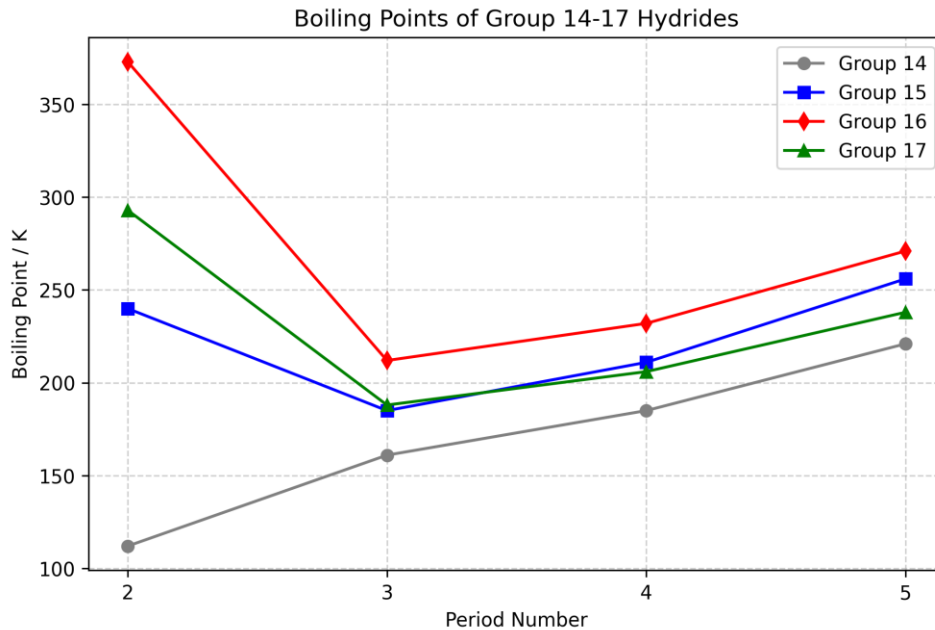
(a) Identify which substance is most likely an ionic compound and justify your choice. **[2]**

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(b) Deduce the bonding type in substance B and name a specific example of such a substance. **[2]**

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2. The graph below illustrates the boiling points of the hydrides of Groups 14, 15, 16, and 17.



(a) Identify the trend in boiling points for Group 14 and explain it in terms of London dispersion forces.

[2]

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(b) Explain why H_2O , HF , and NH_3 deviate from the general trend seen in their respective groups.

[2]

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(c) Considering only H_2O and HF , explain why H_2O has a significantly higher boiling point.

[2]

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3. An aqueous solution of an unknown salt X is tested for electrical conductivity using a simple circuit.

Observation: The bulb lights up brightly when the electrodes are placed in the solution.

(a) Explain why the salt conducts electricity in solution but not in the solid state. **[2]**

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(b) Predict whether salt X will conduct electricity when molten. Provide a reason. **[1]**

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